REMARKS

Claims 2-23 are pending in the present Application.

Reconsideration and allowance of the claims are respectfully requested in view of the following remarks.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 16, 2-4, 6-10, 12-15, 17-18, 20 and 23 stand rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a), as obvious over Wong Shing et al. (US 6,331,229)(hereinafter "Wong Shing"). (Office Action dated 10/6/2009, page 4) Claims 11, 21 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wong Shing. (Office Action dated 10/6/2009, page 6) Applicants respectfully traverse these rejections.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Barient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, or knowledge generally available in the art at the time of the invention, must provide some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). "A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR Int'l Co. v. Teleflex Inc.,* 127 S.Ct. 1727, 1741 (2007). To find obviousness, the Examiner must "identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does." *Id.*

Independent claim 16 recites:

> 16. A process for the production of paper, characterized in that a silica sol containing sulfonic acid groups and/or mercapto groups is added to an aqueous cellulose suspension, and sheet formation, drainage and drying of the sheet are then carried out.

Claims 2-4, 6-8, 12-15, 17-18, 20 and 23 depend, directly or indirectly, from independent claim 16 and therefore include all the limitations thereof.

Independent claims 9-11 recite:

9. A process for the production of paper, characterized in that a silica sol containing sulfonic acid groups and/or mercapto groups and a cationic polymer are added to an aqueous cellulose suspension in any desired sequence, and sheet formation, drainage and drying of the sheet are then carried out.

10. A silica sol containing sulfonic acid groups and having a mean particle size, measured according to TEM, of 2-45 nm.

11. A silica sol containing sulfonic acid groups having a sulfur content, based on SiO_2 of the silica sol, of from 0.1 to 30 mol%.

Wong Shing is directed to a method of increasing retention and drainage in papermaking using high molecular weight water-soluble anionic or nonionic dispersion polymers. (Abstract) The dispersion polymers are produced in the presence of stabilizers (col. 5, l. 49-53). Preferred stabilizers are **polymers** of acrylic acid and AMPS, or methacrylic acid and AMPS, see col. 8, l. 56 - col. 9, l. 15; Examples 2-19 (which describe their preparations); and claims 4-8. The dispersion polymers can be used in combination with inorganic microparticles, e.g. dispersed silica based materials, bentonite, or specific polymers (col. 9, l. 38-50), and/or coagulants, e.g. cationic polymer (col. 10, l. 29-33). Suitable dispersed silica is described in col. 10, 1st paragraph, wherein, inter alia, silica sols are mentioned. However, Wong Shing does **not** disclose, teach or suggest silica sols that contain mercapto groups or sulfonic acid groups.

In making the rejection, the Examiner argues that a silica sol with sulfonic acid groups would inherently form from AMPS and the silica sol described by Wong Shing. (Office Action dated 10/6/2009, page 5, item 14) Applicants respectfully disagree with this statement for the following reasons. As may be taken from e.g. Examples 2, 9, and 10, the monomer AMPS is reacted with the monomer acrylic acid or methacrylic acid by polymerization to form a stabilizer. Thus, the stabilizer is a **polymer** (see also above). Due to the polymerization the AMPS monomer has lost its double bond and forms a moiety (part) of the stabilizer polymer. Accordingly, AMPS monomer as such is no longer present. Therefore, the AMPS monomer is not present when using the dispersion polymer together with the stabilizer polymer (with the AMPS moiety) in the papermaking process, and therefore not present when adding microparticles (e.g. silica sol), or in the Retention Test described in col. 15 (of Wong Shing). For example, according to Table 6, in the Retention Test the polymer is added first to the stock and 10 seconds later the microparticle, e.g. silica sol. It is not clear whether the polymer and silica sol will ever come into contact with

each other, since both are anionic substances and have no ionic affinity to each other. But even if they would contact in the Retention Test or papermaking process, **no reaction** is expected that could result in silica sols with sulfonic acid groups. It is unclear to Applicants how such a reaction would take place. Silica sol is not forming radicals, and the AMPS moiety (of the polymer) has no double bond. In this context, it is noted that retention aids used in papermaking commonly can interact by ionic interactions only (usually there are cationic + anionic substances), not by chemical reactions. Radicals are present during polymerization to produce the dispersion polymer and stabilizer polymer, but **not** when contacting the polymer with silica sol (as microparticle) in papermaking or Retention Test. Accordingly, a silica sol containing sulfonic acid groups are disclosed by Wong Shing and cannot be generated according to the disclosure of Wong Shing.

In summary, Wong Shing does not teach or suggest a silica sol containing sulfonic acid groups. For this reason at least, Wong Shing fails to teach all elements of the claimed invention. Thus, Applicants respectfully assert that the process according to claims 16 and 9, as well as, the corresponding dependent claims are novel and not obvious over Wong Shing. Similarly, Applicants respectfully assert that the silica sols of claims 10 and 11 are novel and not obvious over Wong Shing because Wong Shing does not disclose, teach or suggest silica sols containing sulfonic acid groups, as shown above. Applicants respectfully request reconsideration and withdrawal of the rejections over Wong Shing.

Claims 16, 2-4, 7-9, and 17-19 stand rejected under 35 U.S.C. § 103(a) as being obvious over Reiners et al. (US 6,090,871)(hereinafter "Reiners"). (Office Action dated 10/6/2009, page 7) Applicants respectfully traverse this rejection.

Reiners "relates to auxiliaries for paper finishing, i.e. sizing agents and wet and dry strength agents" (col. 1, l. 5-6; see also col. 29, l. last paragraph), thus is not directed to retention or drainage aids. The composition of Reiners is based on specific polyisocyanates, and can contain a polysiloxane graft copolymer (see e.g. abstract). According to the Preparation Example in col. 38, last paragraph, the polysiloxane graft copolymer can be modified with mercaptopropyl-methyldimethoxysilane. However, such a polysiloxane is chemically **different** from a silica sol. Silica sols do **not contain** siloxane groups. As a consequence thereof, silica sols are highly hydrophilic, whereas the polysiloxane forms an emulsion in water, with Na dodecylbenzenesulfonate as emulsifier, see col. 39, lines 1-10 of Reiners. The particle size of the

formed emulsion is 200 nm, in contrast to claim 10 (of the present application) defining a particle size of 2-45 nm. For these reasons at least, Applicants respectfully assert that Reiners does **not** disclose, teach or suggest silica sols containing sulfonic acid groups and/or mercapto groups, as required by the claimed invention.

Since Reiners does not teach or suggest silica sols containing sulfonic acid groups and/or mercapto groups, Applicants believe that a *prima facie* case of obviousness has not been made and that claims 16, 2-4, 7-9, and 17-19 (and all other claims) not obvious over Reiners. Applicants respectfully request reconsideration and withdrawal of the rejection.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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Date: November 30, 2009
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